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Jens Spille

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Thomson Licensing LLC

P.O. Box 5312

Two Independence Way

PRINCETON, NJ 08543-5312

EXAMINER

LERNER, MARTIN

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/536,739	<b>Applicant(s)</b> SPILLE ET AL.	
	<b>Examiner</b> MARTIN LERNER	<b>Art Unit</b> 2626	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 May 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 10 to 15 and 18 to 19 is/are pending in the application.
- 4a) Of the above claim(s) 18 to 19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10 to 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 18 to 19 are objected to because of the following informalities:

Applicants' treatment of withdrawn claims 18 to 19 is improper. Applicants state that claims 18 to 19 "serve as analogs to canceled withdrawn Claims 16 and 17, respectively." Applicants say that these claims are amended in a similar manner to claims 10 to 15, eliminating "height" and "width", and replacing them with "x" and "y" coordinate information.

However, as a general rule it is improper to amend non-elected claims that were withdrawn pursuant to a restriction requirement. Similarly, it is improper to present new claims that are withdrawn, too, where the new claims are intended to replace non-elected claims. Moreover, claims 18 to 19 are now made dependent upon cancelled claim 1, whereas original withdrawn claims 16 to 17 were not dependent upon cancelled claim 1.

Still, claims 18 to 19 remain withdrawn in accordance with the status identifiers provided by Applicants.

### ***Election/Restrictions***

2. Applicants' election without traverse of Group I, Claims 10 to 15, in the reply filed on 26 August 2008 is acknowledged.

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3. Claims 18 to 19 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 26 August 2008.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 10 to 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Regarding independent claim 10, Applicants' Specification as originally filed does not provide an adequate written description of why the y-location is mapped to audio depth information perpendicular to the 2D video plane. Applicants' Specification, Page 8, Lines 6 to 10, does suggest one brief example of a mapping involving an x-location and a y-location between  $\{x_i, y_i\}$  and  $\{x_i, 0, y_i\}$ , saying that the movement of an object in a y-dimension is mapped to audio movement in the depth. Similarly, Applicants' Specification, Page 3, Line 3 to Page 4, Line 2 suggests a transformation of a 2D coordinate system to 3 dimensional positions so that movement of a graphical object in the screen plane is mapped to movement of an audio object in a depth dimension

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perpendicular to the screen plane. However, the transformation between  $\{x_i, y_i\}$  and  $\{x_i, 0, y_i\}$  would involve an elimination of a coordinate because the middle value of the target set is always zero in  $\{x_i, 0, y_i\}$ . Thus, it is unclear what is really being accomplished by Applicants' transformation, and whether anything different is being done than is disclosed by *Lin et al.* ('018), where the change of size of the object due to movement is translated into a change in loudness of the object in a depth dimension.

Regarding claim 13, the limitation of "a vertical movement" involves new matter. Applicants' Specification, Page 3, Lines 7 to 11, and Page 3, Line 34 to Page 4, Line 2, discloses mapping movement of the audio object, and Page 8, Lines 6 to 10, suggests movement of an object in a y-dimension, but there is no disclosure of "vertical" movement.

Regarding claim 14, the limitation of a mapping being performed "according to a 2x3 matrix or corresponding rotation" involves new matter. Briefly, Applicants' originally-filed Specification, Page 7, Line 28 to Page 8, Line 10, says something about a mapping transformation of a 2 rows by 3 columns vector, but there is nothing that clearly discloses that the mapping transformation is performed with a 2x3 matrix. Admittedly, a matrix could perform the transformation, but that is not disclosed by the Specification. Nor is there anything at all in Applicants' originally-filed Specification that says the transformation relates to a rotation. Applicants have amended the claim to eliminate the limitations of "around the horizontal or width axis", but have not any presented arguments directed to this claim that are responsive to the rejection.

Regarding claim 15, the limitation of “wherein a field of a second node defines the 3D spatialization of a sound source, and said third coordinate and said transforming” involves new matter. Applicants’ originally-filed Specification, Page 2, Line 31 to Page 3, Line 1 and Page 3, Lines 22 to 28, discloses that second nodes may describe the presentation of audio objects, but does not clearly disclose any field of a second node defining a 3D spatialization, or a third coordinate and the transforming. Applicants have not amended the claim, or presented any arguments directed to this claim that are responsive to the rejection.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 10, 12, and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by *Lin et al.* (‘018).

Regarding independent claim 10, *Lin et al.* (‘018) discloses a method of encoding and decoding a presentation of audio data, comprising:

“transforming the 2D location information to a 3D coordinate system, wherein said y-location is mapped to audio depth information perpendicular to the 2D video

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plane and said x-location is mapped to itself” – video image 50 is shown containing two video objects 52, 54 that were previously extracted and matched with associated sound sources (e.g., sound source 1 and sound source 2); video object 52 is a person located in the lower right portion of the video image, and having a face located at column 6, row 3 of the two dimensional grid; video object 54 is a person located in the upper left hand portion of video image 50 and having a face located in column 1, row 1 of the two dimensional grid (column 4, lines 30 to 55: Figure 2); in order to determine position data regarding a third dimension (i.e., depth), it is determined that video object 52 is closer to the viewer than video object 54; a size analysis system 40 could be used to determine the relative depth position of different objects in a three dimensional space based on the relative sizes of the video objects (column 4, line 56 to column 5, line 8: Figure 2);

“adding a third coordinate value to the transformed location information in the 3D coordinate system; and spatializing the sound according to the resulting 3D location information” – the source associated with video object 52 can be assigned to a channel, or mix of channels, that would provide a sound image that is nearby the viewer, while the sound source associated with video object 54 could be assigned to a mix of audio channels that provide a distant sound image (column 4, line 56 to column 5, line 8: Figure 2); a system could be implemented that reconstructs a 3-D space based on the two dimensional video image 50; each sound source can then be assigned to an appropriate audio channel in order to create a realistic 3-D sound field (“spatializing the sound”) (column 5, lines 9 to 29: Figure 2).

Regarding claim 12, *Lin et al. ('018)* discloses that a two dimensional video image 50 is located on a two dimensional grid comprising eight vertical columns and six horizontal rows (column 4, lines 40 to 55; column 6, lines 9 to 17: Figure 2); thus, the rows and columns correspond to "said x and y coordinates".

Regarding claim 13, *Lin et al. ('018)* discloses a size analysis system 40 could be used to determine the relative depth position of different objects in a three dimensional space based on the relative sizes of the video objects; the source associated with video object 52 can be assigned to a channel, or mix of channels, that would provide a sound image that is nearby the viewer, while the sound source associated with video object 54 could be assigned to a mix of audio channels that provide a distant sound image (column 4, line 56 to column 5, line 8: Figure 2); implicitly, a size of a video object changes as it moves closer to or farther away from the screen plane; thus, movement of the object in a direction perpendicular to the screen plane produces at least a change in a vertical size of the object, and an apparent change in the sound image of the object as being nearer or more distant from the viewer in a direction perpendicular to the screen plane follows from the change in size.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.



9. Claims 11, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Lin et al. ('018)* in view of *Scheirer et al. ("AudioBIFS: Describing Audio Scenes with the MPEG-4 Multimedia Standard")*.

*Lin et al. ('018)* notes application to MPEG-4 (column 3, lines 31 to 33), and coding separate sound sources as separate audio objects (column 3, lines 22 to 25), but does not expressly disclose sound sources are described by a parametric scene description having a hierarchical graph structure with nodes, wherein a first node comprises x-location and y-location information, and a second node describes a third coordinate value and data describing the transformation. Moreover, *Lin et al. ('018)* omits mapping by a 2x3 matrix or corresponding rotation.

However, it is known to represent sound sources as first nodes and presentation characteristics of sound sources as second nodes in MPEG-4 as taught by *Scheirer et al.* Specifically, *Scheirer et al.* teaches that AudioBIFS in MPEG-4 represent sound scenes, where an AudioClip node provides audio data that can be referenced by Sound nodes. A hierarchical audio subgraph represents each "child" node as presenting output resulting from one or more "parent" nodes. (III. A. The MPEG-4 Audio System: Page 242: Left Column: Figure 3) An AudioClip can be thought of as a property of the Sound node. The Sound node specifies the location (spatial position) of a sound object in a VRML scene, and a spatialize field specifies whether or not the audio object will be spatialized when presented. (II. C. Sound Scenes in VRML: Pages 238 to 240: Figures 1 and 3) Moreover, 3-D spatialization can be performed according to sound location in the corresponding azimuth and elevation angles. (III. B AudioBIFS Nodes: Page 244,

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Right Column) Implicitly, movement of an object in spherical coordinates corresponds to a rotation. An objective is to enable concise transmission of audiovisual scenes, and to provide a unified framework for sound scenes that use streaming audio and three-dimensional (3-D) spatialization. (I. Introduction: Page 237) It would have been obvious to one having ordinary skill in the art to represent sound sources in a hierarchical graph structure with nodes corresponding to audio objects and presentation of audio objects includes spatialization as taught by *Scheirer et al.* in an audio encoding and decoding system of *Lin et al.* ('018) for a purpose of enabling concise transmission and a unified framework of sound scene spatialization in MPEG-4.

### ***Response to Arguments***

10. Applicants' arguments filed 07 May 2009 have been considered but are moot in view of the new grounds of rejection, necessitated by amendment.

Applicants have amended independent claim 10 in an attempt to respond to the rejection under 35 U.S.C. 112, 1st ¶. Applicant have not produced any arguments for claims 14 and 15 responsive to the rejection under 35 U.S.C. §112, 1<sup>st</sup> ¶.

Moreover, Applicants' amendment to independent claim 10 raises new issues of the adequacy of description as set forth by Applicants' Specification. The Specification, Page 8, Lines 1 to 10, does provide some disclosure for limitations of "x-location" and "y-location" for a mapping between  $\{x_i, y_i\}$  and  $\{x_i, 0, y_i\}$ . However, it is then unclear to one skilled in the art why the center coordinate is always zero in  $\{x_i, 0, y_i\}$ . One skilled in the art, given Applicants' originally filed Specification, would not understand what is

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sought to be accomplished by Applicants' claimed method for spatialization if the center coordinate is always transformed into a value of zero.

Still, it is maintained that the claims are now sufficiently disclosed to apply a prior art rejection. *Lin et al. ('018)* discloses a method of audio spatialization from a two dimensional video plane to a three dimensional sound field. Relative sizes of the objects on the two dimensional video plane are used to determine a relative depth position of objects. The relative depth position of the objects in the video plane provides that a sound image is spatialized to be nearer to the viewer when the object is larger, and a sound image is spatialized to be more distant from the viewer when the object is smaller, so that the objects can be located at different depths in 3-D space. Thus, at least a "y-location" of an object corresponds to a relative size of similar video objects. Equivalently, *Lin et al. ('018)* discloses adding a third coordinate value corresponding to the depth of a 3-D location, and spatializing the sound in accordance with the 3D location information. Furthermore, any movement of a video object in a direction corresponding to the depth dimension of the video plane would, implicitly, result in a change of size for the object at least in a vertical direction, and, thus, three dimensional sound reproduction reflecting that change in position.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to Applicants' disclosure.

Chrysanthakopoulos discloses related art.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARTIN LERNER whose telephone number is (571)272-7608. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Martin Lerner/  
Primary Examiner  
Art Unit 2626  
May 18, 2009